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Type and Location of Speech Disruptions in Adolescents With and Without Specific Language
Impairment

An Honors Program Project Presented to
the Faculty of the Undergraduate
College of Communication Sciences and Disorders
James Madison University

in Partial Fulfillment of the Requirements
for the Degree of Bachelor of Science

by Katherine Elizabeth Davies

May 2016

Accepted by the faculty of the Department of Communication Sciences and Disorders, James Madison University,
in partial fulfillment of the requirements for the Degree of Bachelor of Science.

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PUBLIC PRESENTATION

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Chapter One

Introduction

Language development is a complex process, with children and adolescents experiencing continuous growth in their language system. Language acquisition occurs on a continuum where individuals acquire language at different rates and at different levels. Some experience greater difficulty in acquiring particular aspects of language. Specific language impairment (SLI) is a language disorder that exists without any concurrent conditions or other developmental delays, with the cause of the disorder still unknown. It is one of the most prevalent childhood learning disabilities, with the disorder continuing through adulthood as well (National Institutes of Health, 2011). Speech disruptions, or interruptions in the flow of speech, are prevalent in all speech, but children and adolescents with SLI have a heightened frequency of speech disruptions in comparison with their typically developing (TD) peers. Speech disruptions as used in this research project are not to be confused with stuttering, which is a disorder of speech characterized by excessive and severe repetitions and often complete blocks in the fluency of speech.

Speech disruptions, also referred to in the literature as mazes (Loban, 1976), are particularly common in narration. In analyzing speech disruptions of both 9-11-year-old learning-disabled children and normal children, MacLachlan and Chapman (1988) found a greater number of breakdowns occurring in narration than conversation, while at the same time narratives had longer communication units, i.e., longer utterances. Even with both groups of children experiencing more breakdowns in narratives than conversation, those children who were language impaired especially had greater difficulties producing the longer, more complex

utterances that are characteristic of narratives, as evidenced by their increased number of speech disruptions. Guo, Tomblin, and Samelson (2008) also found that the fourth-grade SLI children in their study used more speech disruptions in narratives than the TD age-matched peers. However, when compared with language-matched TD children who were chronologically younger than the children with SLI, the fourth graders with SLI exhibited about the same speech disruption rate, showing that the amount of speech disruptions correlated with language level.

Although children with SLI produced a greater number of speech disruptions than their age-matched peers, the study by Guo, Tomblin, and Samelson (2008) also found that the two groups displayed different types of speech disruptions. One distinguishing factor between children with SLI and their age-matched peers was that the SLI children had a higher rate of silent pause use, but there was no significant difference in vocal hesitation rates or normal dysfluencies. Most of the speech disruptions of children with SLI occurred before phrases, rather than before sentences, clauses, or words. This finding suggests that not only do children with SLI exhibit more speech disruptions than their TD peers, the type and location of their speech disruptions seem to differ.

Difficulties with finite verb morphology are suggested to be a marker of SLI in preschool and school-age children. Prior to 4 years of age, English-speaking children use tense morphemes inconsistently. TD children soon demonstrate adult-like grammar, with both finite and nonfinite verb forms, reaching competency at about 5 to 7 years of age. However, children with SLI take longer to reach this level of skill and it is questionable if they ever achieve the same level of competency as their TD peers (Hadley & Short, 2006; Taliaferro, Reed, & Patchell, 2015). Children with SLI continue to be behind their peers in tense marking throughout ages five through eight (Rice, 2000). More relevant to this investigator's study, Rice, Hoffman, and

Wexler (2009) looked at children's and adolescents' judgments of finiteness marking in simple questions, and in this longitudinal study, that included participants up to 15 years of age, found that the SLI group consistently performed at lower levels compared to their age-matched peers and younger language-matched children. The judgment task used wh- and yes/no questions with either "be" as a copula/auxiliary or "do" as the auxiliary. The children with SLI failed to recognize when the obligatory tense-marking morphemes were omitted from the sentence. Even by age 15, the adolescents with SLI had not caught up to their peers, suggesting that children with SLI do not outgrow their language impairment as adolescents.

In the Miller, Leonard, and Finneran (2007) study, the researchers examined grammaticality judgments among 16-year-old adolescents with SLI, nonspecific language impairment, and normal language development. The grammatical errors represented were tense omissions, non-tense omissions, and tense intrusions. The adolescents with normal language ability were most sensitive to erroneous morphemes while there was no significant difference between the SLI group and the non-specific language group.

While the research on adolescents with SLI is limited, the existing research seems to parallel the research on children with SLI, that is, their notable difficulties with verb morphology. Research on speech disruptions suggests more disruptions occur when language is more complex or difficult, as is the case for SLI children's use of verb morphology. Problems with verb morphology continue into adolescence. Therefore, the locations and types of disruptions in the speech of adolescents with SLI might be more associated with use of verb morphology than other features of language and the patterns might be different than those of TD adolescents. A more comprehensive look at speech disruptions in adolescents is needed, with an

analysis of the type and place of the disruptions in both language-impaired adolescents and their TD peers.

Dollaghan and Campbell (1992) developed a classification system for different types of speech disruptions found in children's spontaneous language samples. Each speech disruption category was defined in order to reduce subjectivity when using the system to analyze speech samples. The four categories in the Dollaghan and Campbell system are pauses, repetitions, revisions, and orphans. However, when Schwalbe (2012) attempted to use the Dollaghan and Campbell classification system to describe the speech disruption patterns of adolescents with SLI and their TD peers, she found that their system did not fully reflect the characteristics and locations of speech disruptions apparent in the narratives of the adolescents. It may be that the Dollaghan and Campbell system is not sufficiently detailed or not sufficiently sensitive to the maze characteristics of adolescents because it was developed for use with children. Therefore, Schwalbe expanded and refined the Dollaghan and Campbell classification system and trialed it with a small group of TD adolescents and those with SLI, concluding it adequately described the speech disruption patterns of the adolescents.

Using Schwalbe's classification system, it may be possible to analyze the types and locations of speech disruptions in the narrative samples of adolescents with SLI, as well as their TD peers. Using narratives to analyze the language of adolescents as opposed to conversational samples, is more effective in distinguishing between those with SLI and their TD counterparts (Reed & Patchell, 2007). As Reed and Patchell (2007) explained, narratives demand a high level of organization and delivery of information in order to convey an informative message to the listener. When adolescents with normal language have been compared to those with language problems, there have been differences in the amount of informativeness given in the narratives

(Reed & Patchell, 2007). Conversational speech lacks the higher-level planning and cohesion that narratives require, making narratives a more sensitive mode for assessing and analyzing language. Narratives also play a functional role in the lives of adolescents, in both their academic and social lives.

Given in the present study, it is predicted that different patterns with regard to types and locations of speech disruptions of adolescents with SLI and TD counterparts will emerge in their narratives. Specifically, it is predicted that adolescents with SLI will exhibit more speech disruptions associated with verbs than their TD peers. Speech disruption behavior surrounding verbs could include pauses before verbs, repetition or revisions of verbs, or inserting an orphan, i.e., a phoneme or word, before a verb. This project used Schwalbe's classification system to code narratives of older adolescents, those with and without SLI. The codes were analyzed to explore if there were differences in type and location of speech disruptions between the narratives of adolescents with SLI and their TD counterparts. By identifying the type and place of speech disruptions in the language of adolescents with SLI, identification of and intervention for this population could become more effective.

Chapter Two

Methodology

The narrative samples used in this study came from an existing database provided by the research supervisor. The narratives of 24 older adolescents, half with SLI and half without, were transcribed and coded in order to identify patterns for type and location of speech disruptions produced. The narratives were coded using Schwalbe's classification system. Patterns of adolescents with SLI were compared to those of their TD counterparts.

Participants

This study used an existing database for its participants. The participants were those described in Patchell's (2007) dissertation. Participant data were gathered from five females and seven males (N=12) with chronological ages (CA) between 15;0-16;11 (mean=15;9) who met the standard criteria for SLI, on the basis of Leonard's (1998) book, *Children with Specific Language Impairment*. The adolescents with SLI were then matched with 12 TD adolescents. The subjects were matched on gender (5 females, 7 males), CA (14;11-16;9; mean 15;8), nonverbal IQ (NVIQ) (range 89-117), socioeconomic status (SES) (all middle SES), and native language (English only). There were no significant differences between the two groups in regard to CA, NVIQ, and SES. The adolescents with SLI scored at or below -1.25 SD on composite scores of the Test of Word Knowledge (TOWK) and the Clinical Evaluation of Language Fundamentals 3 (CELF-3) language tests. The TD adolescents all scored -1 SD or higher.

The narrative samples were collected by asking the adolescents to tell a story from the sequential pictures in a wordless book, "Frog, Where are You?" (Mayer, 1969). Their narrative descriptions were audiorecorded and orthographically transcribed according to the procedure

described in Patchell's (2007) dissertation. Using a piece of lined paper for each language sample transcript, the researcher entered the code for the occurrence of each individual speech disruption on a separate line, along with the number of the utterance in which the disruption occurred. Appendix A references a sample of one of the narratives of an adolescent with SLI and the corresponding transcription.

Data Coding

Schwalbe's (2012) classification system detailed how to code for speech disruptions. Each code provides information about the type of speech disruption produced, as well as what word the disruption preceded. To ensure the researcher was competent in using the Schwalbe classification system, four sample narratives from younger adolescents were selected from the same database and used as coding practice for the researcher. Once the coding process became comfortable for the researcher, she coded all 24 of the experimental narratives. The coding of the four sample narratives was jointly reviewed with the research supervisor to ensure that the coding was consistent and accurate. After this calibration with the research supervisor, the researcher corrected any discrepancies in her coding of the 24 experimental narratives.

One of the many discussions that occurred during the researcher and research supervisor's calibration of the coding system was whether or not one or more codes were needed in a single set of parenthesis. Prior to calibration, some disruptions were coded as having only one element, where it was later determined that they should be counted as having two or more elements, depending on the number of purposeful adjustments the speaker made in the process of the speech disruption. For example, one disruption might contain a revision followed by a repetition, both encompassed in one set of parenthesis in the transcription. When this is coded,

the researcher and the research supervisor agreed there should be two codes separated by a hyphen in order to capture the pattern associated with the disruption. In recording the disruptions for data analyses, the researcher orthographically entered each speech disruption, and all of its elements, on one line in the coding document so that the number of line entries could be identified.

Another aspect of the calibration was more precisely defining a lexical revision, a grammatical revision, and a combination of the two. It was noted that a frequently occurring revision in the sample narratives was an article being revised to a possessive pronoun. The researcher and supervisor determined this was to be coded as a lexical and grammatical change. In the instance that the same verb was used, but the tense changed, the disruption was coded as a grammatical revision. As another example, if past tense was used before and after a revision, but the root verb changed, a lexical revision was coded.

It was decided that pauses for physiological disruptions, such as coughs, sneezes, hiccups, would not be coded because these would not be reflective of language production. It was also agreed that possessive pronouns should be considered part of a noun phrase, as opposed to an adjective. Another discussion focused on how the description of Schwalbe's (2012) classification system did not always align with what the coder believed was trying to be explored in this research study. Schwalbe's classification system instructed the coder to assign the word immediately following the speech disruption as the reason for the disruption. In coding the samples, it did not always make sense to code the word immediately following the disruption if the cause for the disruption seemed to be a different word in the utterance. Rather than consistently coding the part of speech of the word immediately following the disruption, the intent of the disruption needed to guide the cause of the disruption. For example, if a correct

forward repetition occurred because the speaker was searching for a verb, the letter “c” for verb from the classification system would be used in the code, not the other part of speech from the word produced directly after the disruption, such as an adverb in a disruption like “(uh quickly jumped) quickly leapt off.”

Schwalbe’s classification system coded for nouns and noun phrases separately, but these were collapsed into one code for the purpose of this research study. The codes for verb and verb phrase, as well as preposition and prepositional phrase, were also collapsed. These distinctions were not crucial in grasping the patterns of what was going on in the adolescents’ narratives.

Reliability

Because there is a recognized degree of subjectivity and variance in coding and analyzing language, determining reliability is important to ensure that the interpretation of the results is valid. Intra-rater reliability was completed by the researcher re-coding three randomly selected narrative samples from the SLI group and three from the TD group two weeks after her first codings and without accessing those coded samples. In order to test for inter-rater reliability, the research supervisor independently coded these same six samples. The random selection of samples was completed by blindly picking out six different slips of paper, each with a language sample number, from a container. The selected narrative samples were 2, 7, and 10 from the SLI group and 1, 5, and 11 from the TD group. The codes from the second coding were compared to the original codes for intra-rater reliability. Once the research supervisor coded those same six samples, inter-rater reliability was determined by comparing the supervisor’s codes to the researcher’s original codes.

The evaluation of the reliability began at the most general level of analysis and then underwent further scrutiny to increasingly finer analysis. Percent agreements were calculated to determine the correspondence between the two codings for each of the six samples and for the overall agreement. It was expected that as the analysis became more detailed, less agreement would occur. A lesser degree of agreement between the researcher and the supervisor was also anticipated compared to the agreement between the researcher's first and second codings. In the following tables, time one refers to the original coding and time two refers to the second coding. In the tables depicting inter-rater reliability, coder one refers to the researcher and coder two refers to the research supervisor.

The first step in analyzing the reliability was to determine the overall number of speech disruptions in the samples. In coding each sample, each speech disruption, denoted by a closed set of parentheses in the written transcript, was entered on a separate line preceded by the utterance number. The total number of speech disruptions was measured by counting the number of separate lines in the coding. Tables 1 and 2 show the results for intra-rater and inter-rater reliability, respectively.

Table 1. Number of Speech Disruptions (Intra-rater)			
Sample Number	Time 1	Time 2	Percent Agreement (%)
2.2.1	15	15	100
2.2.5	21	21	100
2.2.11	14	14	100
1.2.2	22	22	100
1.2.7	11	11	100
1.2.10	14	14	100
Avg. Percent Agreement			100
Total	97	97	

Table 2. Number of Speech Disruptions (Inter-rater)			
Sample Number	Coder 1	Coder 2	Percent Agreement (%)
2.2.1	15	14	93.33
2.2.5	21	22	95.45
2.2.11	14	14	100
1.2.2	22	22	100
1.2.7	11	11	100
1.2.10	14	14	100
Avg. Percent Agreement			98.13
Total	97	97	

For more exact analysis, the codings were then examined to see if the speech disruptions were identified in the same places in the sample each time coding was done. This was determined by examining if the speech disruption's corresponding line number in the first coding matched with the corresponding line number in the second coding. For example, in sample 2.2.1, the line number 28 was listed three times, indicating three disruptions in the particular utterance, in the codings from both time one and time two. This was recorded as 100% agreement for intra-rater reliability. Percent agreement was calculated by counting the line numbers that match between the two codings and dividing that by the total number of line numbers accounted for between the two codings. If a line number did not have a corresponding match in the other coding, that line number counted toward the total, or denominator of the calculation. In the case of sample 2.2.1 for inter-rater reliability, coder one listed line 28 three times, but coder two only listed it twice. This meant that the number two went toward the numerator and the number three went toward the denominator of the equation. Any speech disruptions that did not have a matching line number from this calculation were exempt from the rest of the reliability calculations. Tables 3 and 4 show the reliability results for intra-rater and inter-rater agreement, respectively.

Table 3. Number of Same Speech Disruptions (Intra-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	15	15	100
2.2.5	21	21	100
2.2.11	14	14	100
1.2.2	22	22	100
1.2.7	11	11	100
1.2.10	14	14	100
Avg. Percent Agreement			100
Total	97	97	

Table 4. Number of Same Speech Disruptions (Inter-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	13	15	86.67
2.2.5	21	21	100
2.2.11	14	14	100
1.2.2	22	22	100
1.2.7	11	11	100
1.2.10	13	14	92.86
Avg. Percent Agreement			96.59
Total	94	97	

Most of the speech disruptions had only one code, indicating only one type of disruption, but some had more than one. An excerpt from a narrative of an adolescent with SLI is “the (um, bees nest) beehive,” which contains two elements in one speech disruption. The two elements are “um,” a single filled pause, and “bees nest,” a lexical correct forward revision. The total number of elements identified was measured by counting the number of codes. The speech disruptions with multiple elements had each code separated by a hyphen. Any speech disruption element that did not have a match in this calculation were omitted from the rest of the reliability calculations. Tables 5 and 6 show these results.

Table 5. Number of Elements Identified (Intra-rater)			
Sample Number	Time 1	Time 2	Percent Agreement (%)
2.2.1	20	20	100
2.2.5	24	25	96
2.2.11	15	15	100
1.2.2	24	24	100
1.2.7	11	11	100
1.2.10	14	17	82.35
Avg. Percent Agreement			96.39
Total	108	112	

Table 6. Number of Elements Identified (Inter-rater)			
Sample Number	Coder 1	Coder 2	Percent Agreement (%)
2.2.1	20	15	75
2.2.5	24	26	92.31
2.2.11	15	15	100
1.2.2	24	24	100
1.2.7	11	11	100
1.2.10	14	14	100
Avg. Percent Agreement			94.55
Total	108	105	

Examination of reliability also included measuring one agreement with regard to categories of speech disruptions, for example, revisions, repetitions, filled pauses and orphans, or silent pauses. In the coding system, each code has a number that represents the broad category of disruption. Numbers one through four were revisions, five through eight repetitions, nine through 14 filled pauses and orphans, and 15 was a silent pause. When calculating percent agreement, only the speech disruptions that had an equivalent line number in each of the two codings were used. The number of speech disruption pairs with the same type was divided by the total number of speech disruption pairs. Tables 7 and 8 show these reliability results.

Table 7. Broad Category of Speech Disruption (Intra-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	20	20	100
2.2.5	24	24	100
2.2.11	15	15	100
1.2.2	24	24	100
1.2.7	11	11	100
1.2.10	14	14	100
Avg. Percent Agreement			100
Total	108	108	

Table 8. Broad Category of Speech Disruption (Inter-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	13	14	92.86
2.2.5	24	24	100
2.2.11	15	15	100
1.2.2	23	24	95.83
1.2.7	11	11	100
1.2.10	13	13	100
Avg. Percent Agreement			98.12
Total	99	101	

A finer-grained examination of reliability looked at types of disruptions within each category. Within the revision category, there were four types. The revision type was shown in the first component of the code. Number one was a correct forward revision, two an incorrect forward revision, three an incorrect forward incorrect revision, and four a correct forward incorrect revision. Appendix B contains the descriptions and examples of each revision type, taken from Table 2.15 in Schwalbe's (2012) thesis. The percent agreement for type of revision was calculated by counting the number of matching revision types between the two codings and dividing that by the total number of revisions. Tables 9 and 10 show these results.

Table 9. Revision Type (1, 2, 3, or 4) (Intra-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	9	9	100
2.2.5	4	5	80
2.2.11	1	1	100
1.2.2	2	2	100
1.2.7	0	1	0
1.2.10	2	2	100
Avg. Percent Agreement			80
Total	18	20	

Table 10. Revision Type (1, 2, 3, or 4) (Inter-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	6	7	85.71
2.2.5	4	5	80
2.2.11	0	1	0
1.2.2	2	2	100
1.2.7	0	1	0
1.2.10	1	2	50
Avg. Percent Agreement			52.62
Total	13	18	

To further describe the type of revision, the letters A, B, or C were used as the second component of the code. The percent agreement for this type of revision was calculated the same way as the first number of the code, i.e., by counting the number of matching revision types between the two codings and dividing that by the total number of revisions. Tables 11 and 12 show these results.

Table 11. Revision: Lexical, Grammatical, or Both (A, B, or C) (Intra-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	7	9	77.78
2.2.5	5	5	100
2.2.11	1	1	100
1.2.2	2	2	100
1.2.7	1	1	100
1.2.10	1	2	50
Avg. Percent Agreement			87.96
Total	17	20	

Table 12. Revision: Lexical, Grammatical, or Both (A, B, or C) (Inter-rater)			
Sample Number	Matched Pairs	Total Pairs	Percent Agreement (%)
2.2.1	4	7	57.14
2.2.5	4	5	80
2.2.11	1	1	100
1.2.2	2	2	100
1.2.7	1	1	100
1.2.10	2	2	100
Avg. Percent Agreement			89.52
Total	14	15	

The final component of the code was the reason for the speech disruption. The percent agreement was calculated by taking the number of matched letters and dividing it by the total number of speech disruption elements. Only those elements that had a corresponding element in the other coding were accounted for in the total. In the event that two elements were given in one coding and one element in the other, only the one corresponding code would be analyzed.

Schwalbe's (2012) system did not account for coding pronouns; therefore, the coders regarded pronouns as nouns in this project, but agreed that pronouns would have been best reflected in their own category in the coding system. Because in this research project, noun and

noun phrase were consolidated, as were verb and verb phrase and preposition and prepositional phrase, if a coder used an “a” denoting a noun and the other coder chose “b” for the code of that same disruption, this was considered a match. Tables 13 and 14 show these reliability results.

The only code that was not accounted for in this approach to percent agreement calculation was 15iii, i.e., short utterance initiating conjunction and clause, because the classification system did not require a reason for disruption be written for this particular code. In one of the samples, there were two instances where 15i and 15iii were given as the codes for the same disruption. Since 15i has a reason that needs to be provided and 15iii does not, these two speech disruptions were not included in the percent agreement calculation. In another sample, the research supervisor accidentally left out a reason for disruption, so that line was also not included in the percent agreement.

Table 13. Reason for Disruption (Intra-rater)			
Sample Number	Time 1	Time 2	Percent Agreement (%)
2.2.1	17	20	85
2.2.5	22	24	91.67
2.2.11	12	15	80
1.2.2	24	24	100
1.2.7	7	11	63.64
1.2.10	10	12	83.33
Avg. Percent Agreement			83.94
Total	92	106	

Table 14. Reason for Disruption (Inter-rater)			
Sample Number	Coder 1	Coder 2	Percent Agreement (%)
2.2.1	11	14	78.57
2.2.5	21	24	87.5
2.2.11	6	10	60
1.2.2	20	22	90.91
1.2.7	9	11	81.82
1.2.10	9	10	90
Avg. Percent Agreement			81.47
Total	76	91	

The results of the several measures of intra-rater and inter-rater reliability indicated overall high levels of agreement for the broader analysis. For measurement agreement at finer levels of analyses, percent agreements were acceptable. These results suggest that the codings used for the results of this study are trustworthy.

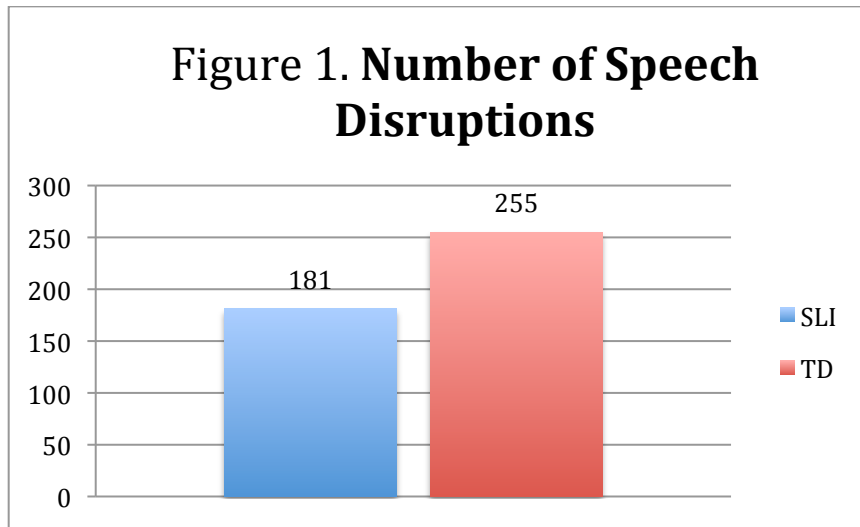
Chapter Three

Results

Once the 24 narratives were coded using Schwalbe's classification system, data analysis began by totaling the number of speech disruptions.

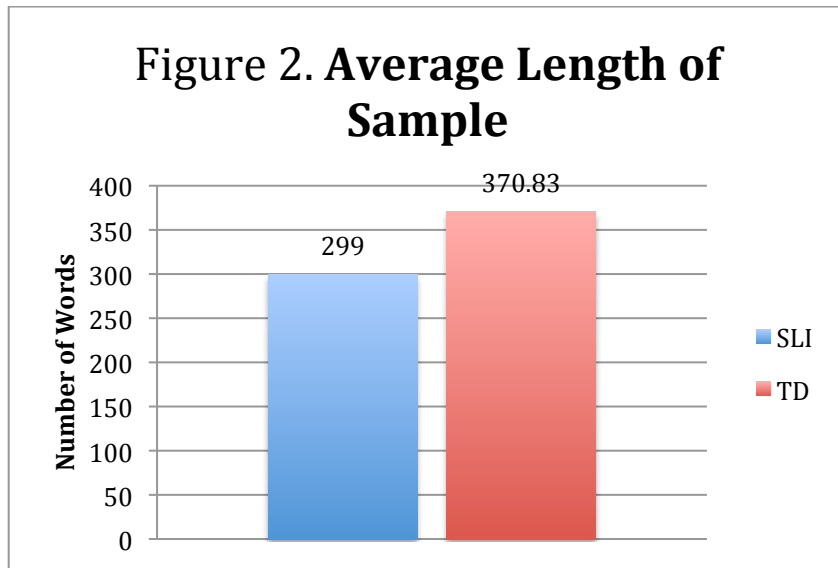
Number of Speech Disruptions

Since each line represented an occurrence of a disruption, the lines for all of the 12 samples for each group were counted, which totaled to 181 speech disruptions for the adolescents with SLI and 255 speech disruptions for the TD adolescents. Figure 1 displays the number of disruptions for each group.



The average length of speech sample for the SLI group was calculated by dividing the total number of words produced in the 12 samples by 12. The same calculation was done for the 12 TD adolescents. The SLI group had, on average, 299 words per sample while the TD group had, on average, 370.83 words per sample. Figure 2 depicts this difference. The percent difference in the average length of sample is 21.45%. While the TD group displayed a greater

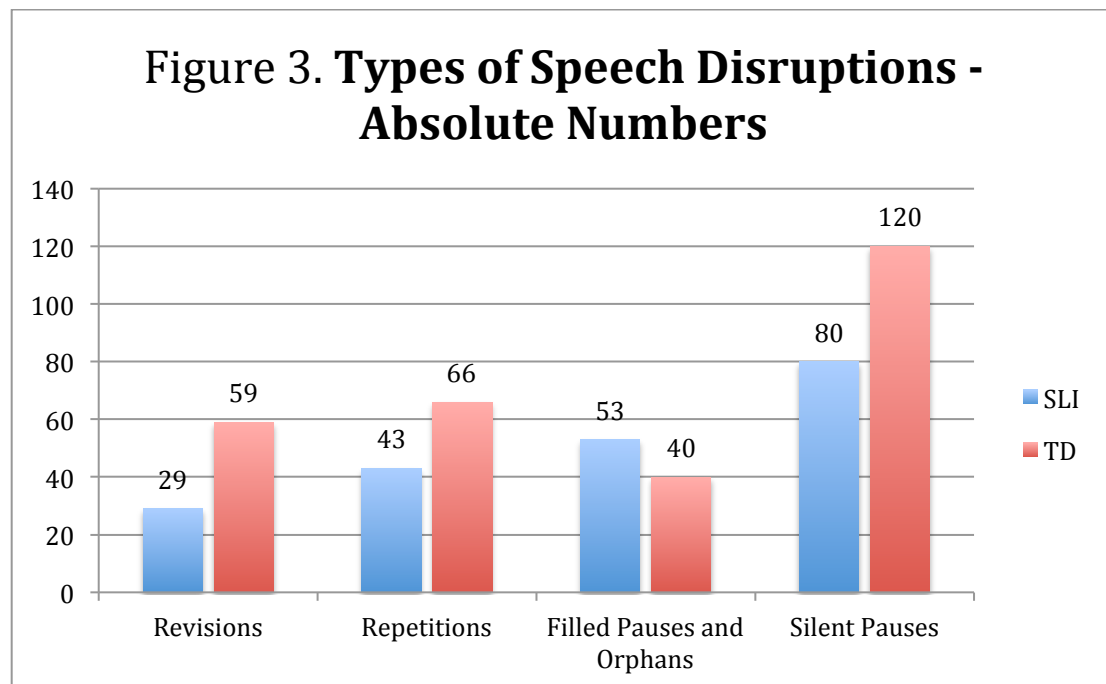
number of speech disruptions, they also used longer speech samples, on average, thus creating greater opportunities for speech disruptions to occur.

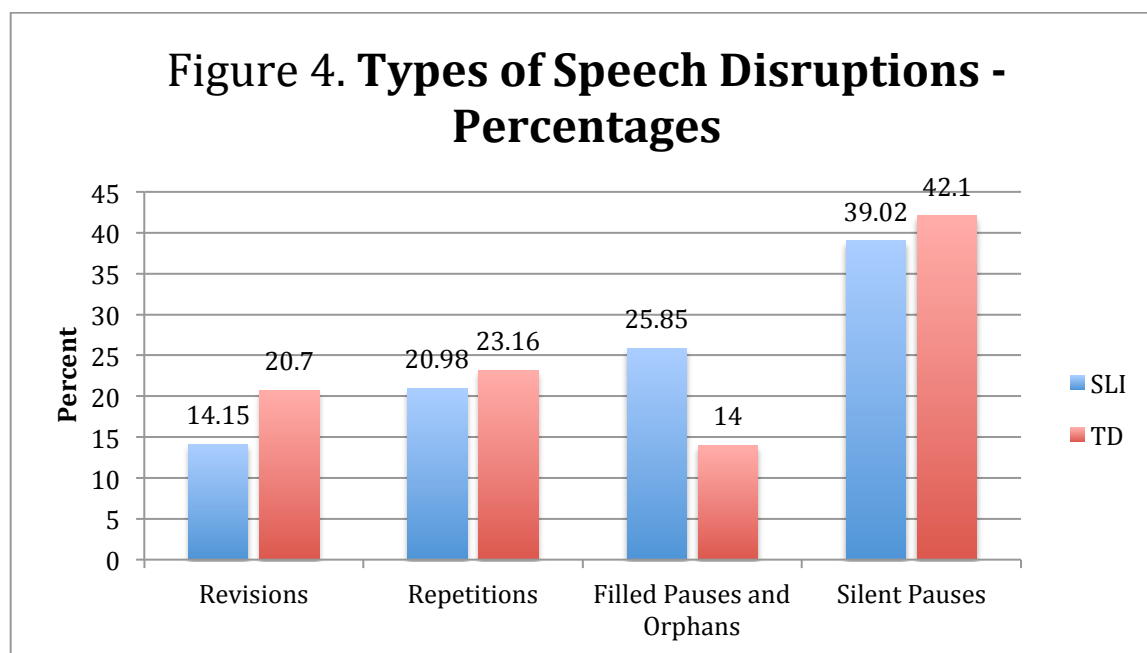


Types of Speech Disruptions

The types of speech disruptions used in the narrative samples of the adolescents with SLI and the TD adolescents were coded. Appendix C contains the speech disruption types, descriptions, and examples, taken from Table 2.14 and 2.15 in Schwalbe's (2012) thesis. Some speech disruptions contained more than one element; therefore more than one type. The SLI group had a total of 205 speech disruption elements and the TD group had a total of 285 elements. In comparing the types of speech disruptions produced by each cohort, it was revealed that using absolute numbers as a basis for comparison might not be sufficiently sensitive to reveal differences between the TD and SLI groups. Figure 3 uses absolute numbers of speech disruptions while Figure 4 uses percentages to more accurately depict the patterns of each type of speech disruption used. The percentage was calculated by dividing the absolute number of each type of speech disruption by the total number of speech disruption elements. In looking at Figure

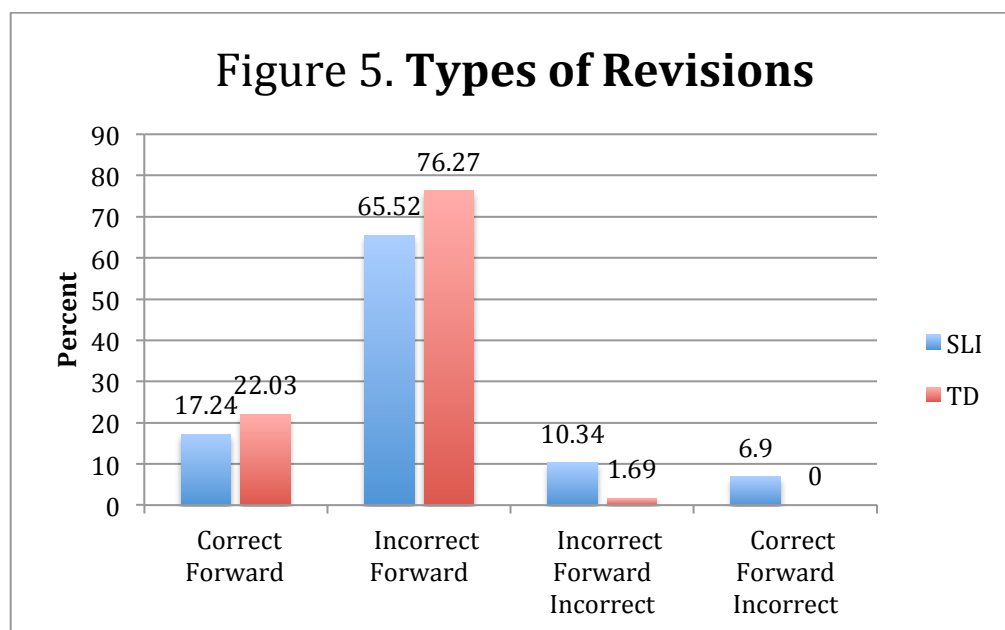
4, the TD group exhibited a greater number of speech disruptions across each type with the exception of filled pauses and orphans. However, for two (i.e., repetitions, silent pauses) of four types of speech disruptions, the differences in percent of use was only about 2-3%. In contrast, the TD group used a notable 6 ½ percent more revision types of speech disruptions than the SLI group. However, the largest difference between groups occurred for the speech disruption type of filled pauses and orphans, with the adolescents with SLI using 25.85% filled pauses and orphans, compared to 14% for the TD adolescents.



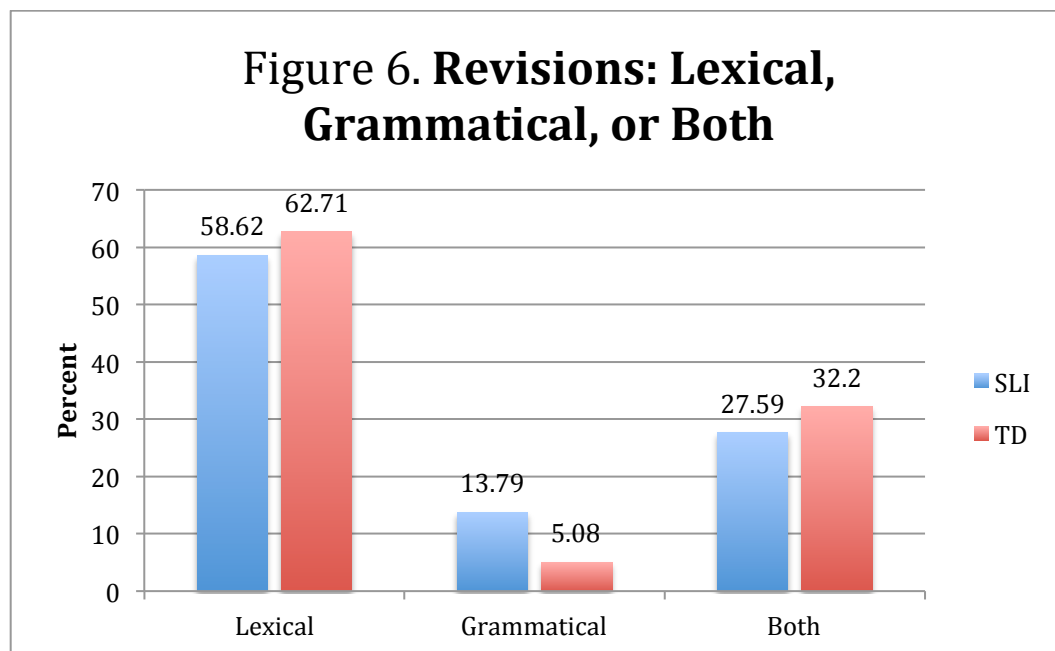


Revision Types of Disruptions

In a closer look at the use of the different types of speech disruptions, for the revision type, of all 29 revisions used by adolescents with SLI, 17.24% were correct forward, 65.52% were incorrect forward, 10.34% were incorrect forward incorrect, and 6.9% were correct forward incorrect. These four types reflect accuracy patterns in the revisions the adolescents used. Of all 59 revisions for the TD adolescents, 22.03% were correct forward, 76.27% were incorrect forward, 1.69% were incorrect forward incorrect, and 0% were correct forward incorrect. Figure 5 shows these results.

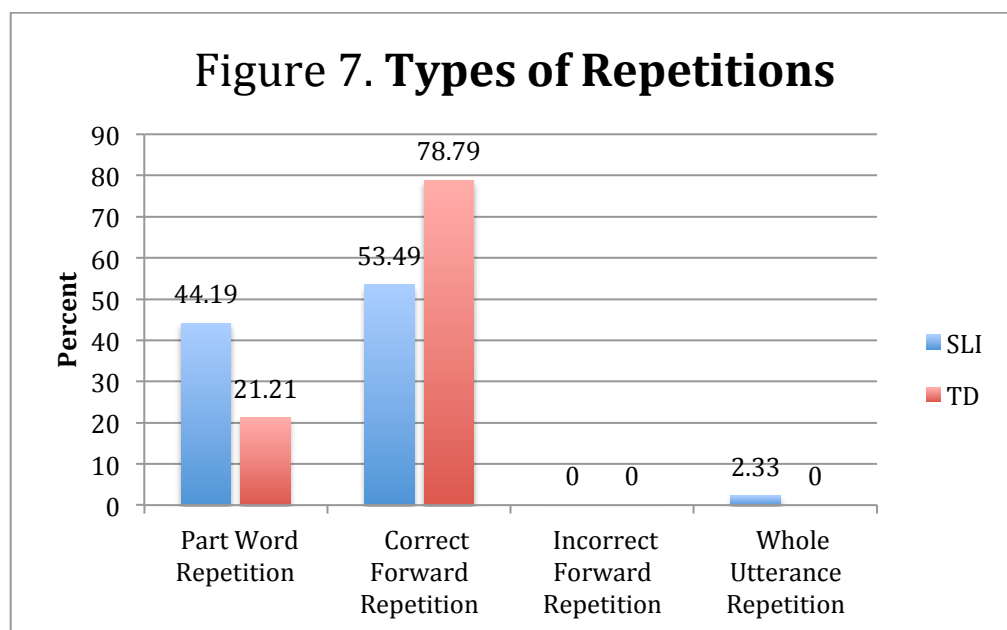


With regard to the linguistic element(s) involved in revisions, of all 29 revisions for adolescents with SLI, 58.62% were lexical, 13.79% were grammatical, and 27.59% were both lexical and grammatical. Of all 59 revisions for the TD adolescents, 62.71% were lexical, 5.08% were grammatical, and 32.2% were both lexical and grammatical. A notable difference emerged between groups for the revisions that involved grammatical elements. The SLIs' use of grammatical revisions was almost three times greater than that of the TD groups. Figure 6 shows these results.



Repetition Types of Disruptions

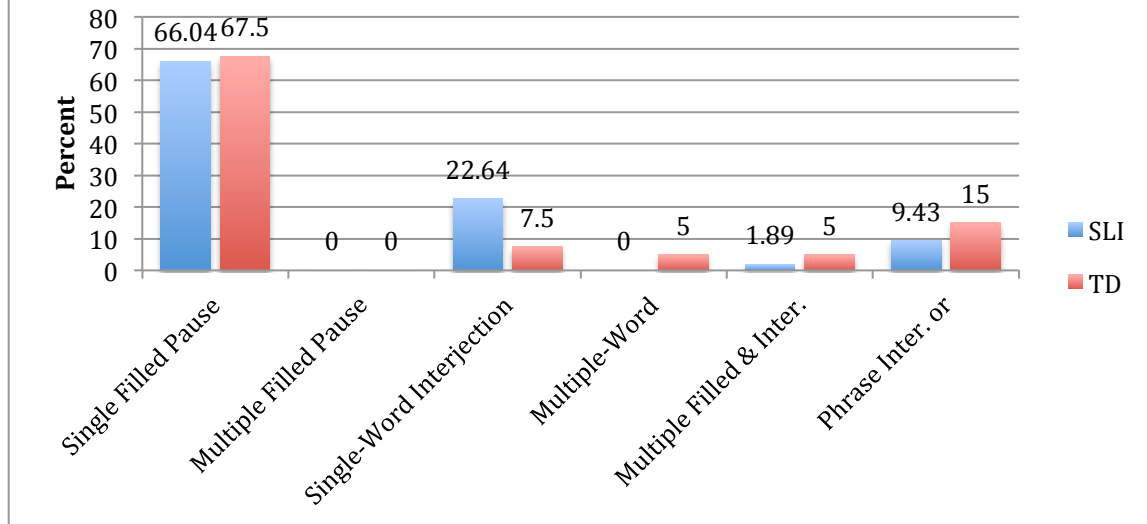
Of all 43 repetitions for adolescents with SLI, 44.19% were part-word, 53.49% were correct forward, 0% were incorrect forward, and 2.33% were whole utterance repetitions. Of all 66 repetitions for the TD adolescents, 21.21% were part-word, 78.79% were correct forward, 0% were incorrect forward, and 0% were whole utterance. Of note, the SLI adolescents used approximately 23% more part-word repetitions than the TD group, which represented about twice as many used by the SLI group. By comparison, the TD group used about 25% more correct forward repetitions than the SLI group. Overall, however, correct forward repetitions were the most frequently used type of repetitions for both groups. Figure 7 shows these results.



Filled Pauses and Orphan Types of Disruptions

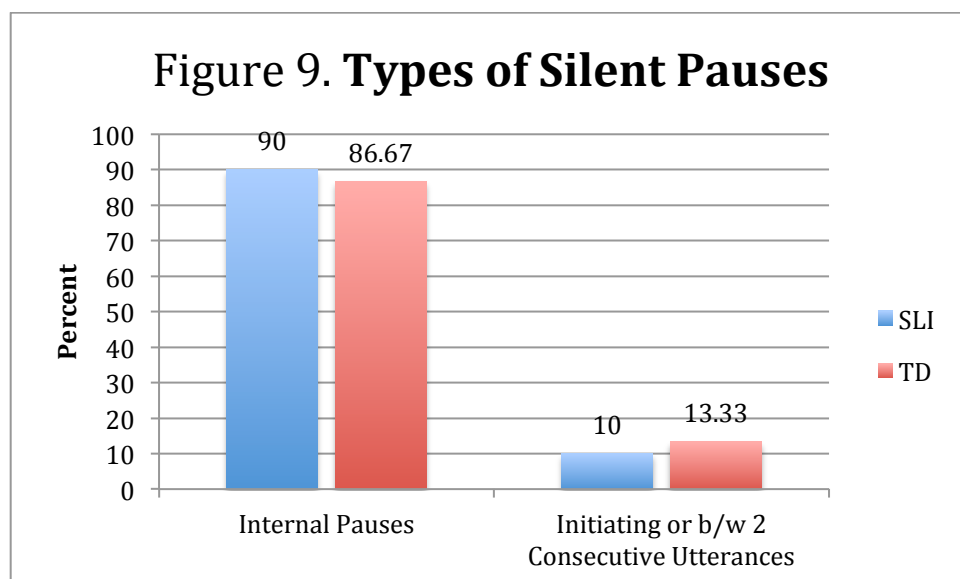
Of all 53 filled pauses and orphans for adolescents with SLI, 66.04% were single filled pauses, 0% were multiple filled pauses, 22.64% were single-word interjections, 0% were multiple-word interjections, 1.89% were multiple filled and interjection combination, and 9.43% were phrase interjection or abandoned attempts. Of all 40 filled pauses and orphans for the TD adolescents, 67.5% were single filled pauses, 0% were multiple filled pauses, 7.5% were single-word interjections, and 5% were multiple-word interjections, 5% were multiple filled and interjection combination, and 15% were phrase interjection or abandoned. The most notable difference between the two groups was for the single-word interjection type of filled pauses and orphans, with the SLI adolescents using many more of this type of disruption than TD adolescents, that is, 22.64% and 7.5%, respectively. Figure 8 shows these results.

Figure 8. Types of Filled Pauses and Orphans



Silent Pause Types of Disruptions

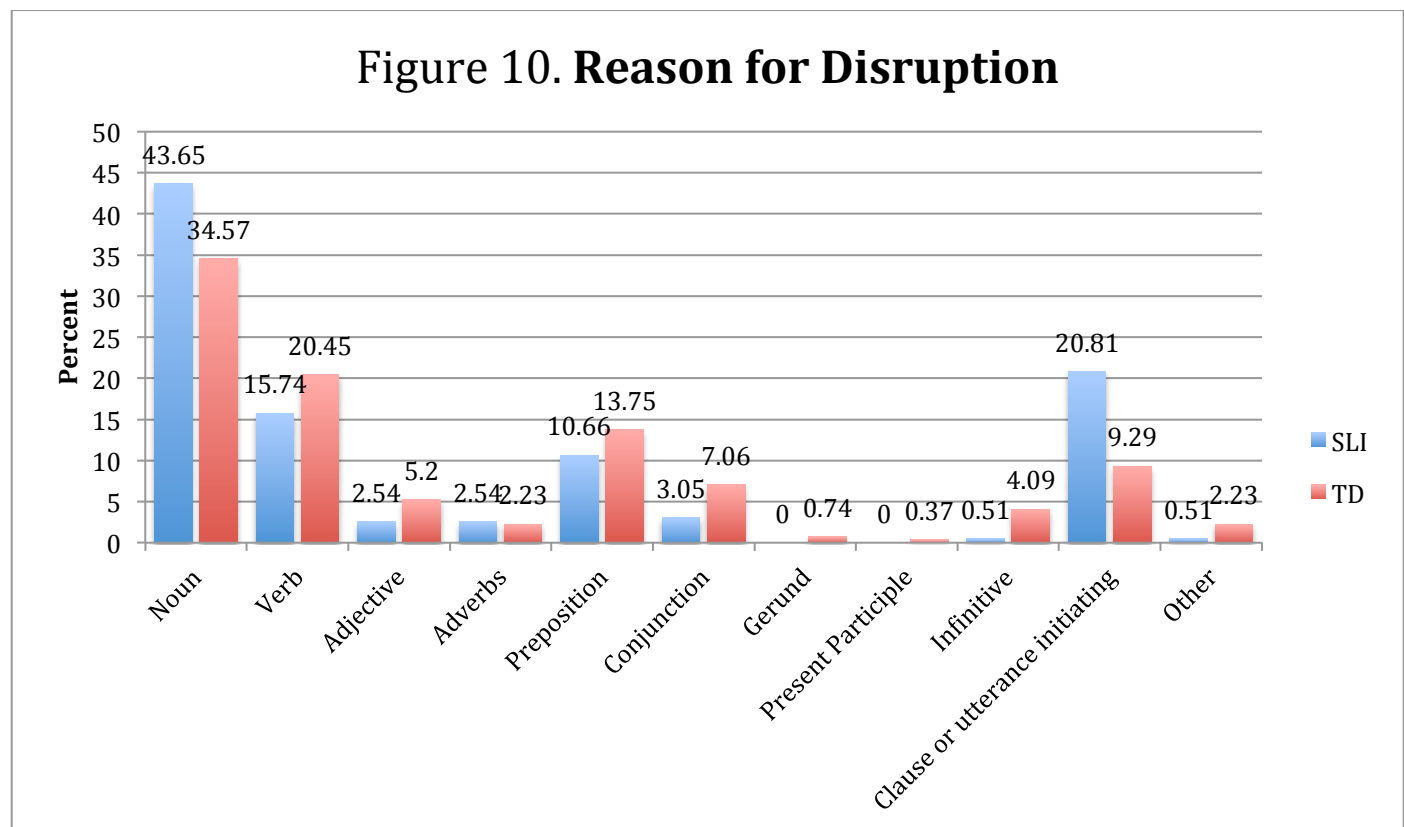
Of all 80 silent pauses for adolescents with SLI, 90% were internal and 10% were initiating or between two consecutive utterances. Long utterance initiating conjunction and clause pauses were listed in the coding system, but the adolescents did not use any of these types. Of all 120 silent pauses for the TD adolescents, 86.67% were internal and 13.33% were initiating or between two consecutive utterances. Long utterance initiating conjunction and clause pauses, as well as long internal pauses, were listed in the coding system, but these also were not present in these speech samples. Both groups presented with similar patterns of use with regard to the silent pauses type of disruption. Figure 9 shows the types of silent pauses found.



Reasons for Speech Disruptions

The final element of the code given for a speech disruption was the reason for or element(s) causing the speech disruption. There were 12 different possible reasons. Schwalbe's coding system did not require a reason be given for short utterance initiating conjunction and clause, long utterance initiating conjunction and clause, and long between consecutive utterances. Of the 197 reasons that were coded for the disruptions of the adolescents with SLI, 43.65% were nouns, 15.74% were verbs, 2.54% were adjectives, 2.54% were adverbs, 10.66% were prepositions, 3.05% were conjunctions, 0.51% were infinitives, 20.81% were clause or utterance initiating, and 0.51% were other reasons, such as the disruption being at the end of a sentence. Gerunds, present participles, and past participles were categories in the coding system, but these never presented themselves as reasons or elements causing a speech disruption. Of the 269 reasons that were coded for the disruptions of the TD adolescents, 34.57% were nouns, 20.45% were verbs, 5.2% were adjectives, 2.23% were adverbs, 13.75% were prepositions, 7.06% were conjunctions, 0.74% were gerunds, 0.37% were present participles, 4.09% were

infinitives, 9.29% were clause or utterance initiating, and 2.23% were other reasons, such as made-up words, onomatopoeia, or a speech disruption at the end of a sentence. Past participle was a category in the coding system that never presented itself as a reason or element causing a speech disruption. Nouns represented about a 9% difference between groups with nouns emerging as the reason for disruptions more often for the SLI adolescents than the TD adolescents. Similarly, clause or utterance initiating disruptions represented an approximate 11½% difference between groups, again with this type of disruption being associated more with the SLI group than the TD group. Figure 10 shows these results.



Chapter Four

Discussion

Summary of Results

The objective of this research project was to identify the type and location of speech disruptions in adolescents with and without SLI. Previous research has suggested narratives as a sensitive sampling approach for comparing the speech of TD children and those with SLI. Since SLI is a lifelong impairment and research has shown children with SLI using more speech disruptions than their TD peers, adolescents with SLI are expected to continue to have speech disruptions. Speech disruptions in adolescents with SLI may manifest themselves differently than in young children with SLI. With limited research on adolescents with SLI, there is not as much information about their speech patterns as there is with children with SLI. It was projected that this project would show adolescents with SLI producing a higher number of speech disruptions than their TD counterparts. Another prediction was that the adolescents with SLI would have greater difficulty with verbs over nouns since children with SLI have revealed difficulties with finite verb morphology.

The types and locations of speech disruptions in narratives were analyzed using Schwalbe's (2012) classification system. The narrative samples were produced by 12 adolescents with SLI and 12 matched TD adolescents. After coding each of the narratives using the classification system, the speech disruption behavior was analyzed and comparisons were made between the two groups.

When both the length of the language samples and the absolute number of speech disruptions are taken into account, the two groups have a similar amount of disruptions. The SLI

group had 181 speech disruptions and 3,588 total words across all 12 samples, meaning that of all words produced, 5.04% of them were disruptions. The TD group had 255 speech disruptions and 4,450 total words, meaning 5.73% of their words were involved in speech disruptions. This suggests that longer language samples create more opportunities for speech disruptions and that the language gap between individuals with SLI and their TD peers may narrow as they move from childhood to adolescence. More research on adolescents with SLI is needed to verify that these results are not just an artifact of the coding system. These results are consistent with Loban's (1976) findings that as utterances increase in length, the number of disruptions in the utterances also increase, so the proportion remains essentially the same. In contrast, MacLachlan and Chapman (1988) found a higher number of communication breakdowns in learning-disabled children compared to their TD peers, but the sample population of learning-disabled children is not directly comparable to this project's sample of adolescents with SLI. Guo, Tomblin, and Samelson (2008) also found a higher speech disruption rate in fourth-graders with SLI compared to their age-matched peers, but those with SLI had comparable rates to the younger language-matched children.

With regard to types of disruptions, two major differences emerged. The TD group used a notable 6½% more revisions than the SLI group. The two groups both used incorrect forward revisions more than any other revision type, and for both groups, the majority of revisions were lexical. The second most frequent revision type was both lexical and grammatical. Overall, grammatical revisions were the least occurring type of revision, but the SLI group used almost three times the amount of grammatical revisions than the TD group. It is possible that this finding is a reflection of difficulties with grammatical aspects of language, i.e., syntax and particularly morphology, that are characteristic difficulties in children and adolescents with SLI

(Hadley & Short, 2006; Rice, 2000; Rice, Hoffman, & Wexler, 2009; Miller, Leonard, & Finneran, 2007).

The second major finding regarding types of disruptions involves filled pauses and orphans. The SLI group used about 12% more filled pauses and orphans than the TD group. Both groups produced mostly single filled pauses, with a negligible difference between the two groups. The most notable difference between the two groups was with the SLI group using about 15% more single-word interjections than the TD group.

The TD group produced about 25% more correct forward repetitions than the SLI group and the SLI group produced about 23% more part-word repetitions than the TD group. The TD group used only a nominally larger proportion of silent pauses (about 3% more) than the SLI group. Overall, both groups displayed similar patterns of use within the speech disruption type of silent pauses.

Unlike the prediction that the adolescents with SLI would have more speech disruptions caused by verbs, the SLI group exhibited more of their disruptions on nouns than on verbs. This may stem from word finding issues in vocabulary. Although difficulties with finite verb morphology have been observed in children with SLI, verb morphological issues in individuals with SLI may not play as big of a role on the occurrence of speech disruptions as word finding (Hadley & Short, 2006; Rice, Hoffman, & Wexler, 2009).

The adolescents with SLI have a higher number of speech disruptions due to clause or utterance initiating than their TD peers. This suggests that adolescents with SLI may need more time to process and formulate their language. Neither gerunds nor present participles were used

in the narratives of the adolescents with SLI, suggesting that those with SLI do not share the same complexity of speech as their TD peers.

Implications for Adolescents with SLI

With limited research on adolescents with SLI, identifying and providing intervention for this population is restricted. This project can provide some insight on what may or may not be identifying factors and topics of intervention for adolescents with SLI, but more research is needed. Analyzing the speech of adolescents with SLI can be used to provide children with SLI and their parents with information to prepare them for what's to come in the future.

TD adolescents have, on average, longer utterances, meaning their speech is likely more complex in sentence length and structure, and possibly word choice. Analyzing these aspects of narratives could provide greater insight into this assumption. Rather than identifying adolescents with SLI by their type and location of speech disruptions, the overall complexity and organization of narratives may be more discerning.

Unlike some of the existing research on children with SLI, this project showed that speech disruptions in adolescents with SLI do not necessarily occur more frequently on verbs over nouns. This project showed the opposite, although the adolescents with SLI did show more grammatical revisions than their TD counterparts. This correlates with the research of Hadley and Short (2006) that children and adolescents with SLI have difficulties with grammar. Adolescents with SLI showed greater difficulty in initiating phrases with more speech disruptions at the beginning of clauses and utterances. This could be an area for further research to see if this is an identifying factor in individuals with SLI, and therefore an area for intervention. In analyzing the results of this project, it appears that the type of speech disruptions

produced are fairly consistent between both groups, making the location of speech disruptions more predictive of differentiating adolescents with and without SLI.

Limitations of This Research Project

The original intent of this project was to use Schwalbe's (2012) coding system to code for disruptions to explore adolescents' speech disruptions, but in using the system, some weaknesses were discovered and revisions were made. Appendix D shows the edited version of Schwalbe's coding guide that may better reflect speech disruptions in future research. Noun and noun phrase, verb and verb phrase, and preposition and prepositional phrase would be consolidated into simply noun, verb, and preposition categories. Incorrect forward repetitions, multiple filled pauses, past participle, or a long utterance initiating conjunction and clause silent pause never presented themselves in the 24 narratives, therefore are most likely not representative in the speech of adolescents and can be removed from the coding guide. Appendix D also shows how the coding instructions were modified for this current project and how these modifications could be used for future research. Schwalbe's (2012) instructions had the coder determine the reason for disruption by coding the part of speech that the disruption immediately preceded. This project revealed that the speech disruption was not always caused by the word immediately following the disruption. The researcher determined what word likely caused the disruption and then coded the part of speech for that word, regardless if it immediately followed the speech disruption or not.

While the coding guide attempts to make the coding process as objective as possible, it is still subjective. As seen through the reliability process, even if two different researchers use the

same coding guide, the codes differ. Analyzing the results as a whole and having a large enough sample size help to reduce the effect of subjectivity on the results.

Directions for Future Research

In future research, an analysis of the type-token ratio (TTR) could be done in order to account for semantic complexity in the narratives of adolescents. Producing more speech disruptions, thus having a higher TTR, could be a result of trying to search for the right word. Greater speech disruptions may not indicate lower language ability. Another consideration is that counting all of the disruptions might distort what is really going on. Adolescents with SLI may start a narrative off fairly well and may not begin to stand out from their TD peers until the plot and complexity increases towards the middle of the narrative. Only looking at the middle 50% of the utterances may provide a better picture of the speech of the adolescents with SLI. A proportion comparing the disruptions in the first 25% of the narrative to the disruptions in the middle 50% of the narrative could assess this validity.

The analysis on verbs could be taken one step further. The TD adolescents may have used disruptions as a way of handling potentially more complex verb morphology, whereas the complexity of the verbs used by the SLI adolescents was less thus using fewer disruptions. An analysis of the verb complexity of the two groups and looking at the occurrence of disruptions related to the complexity might reveal insights to SLIs' morphological prowess. Examining if a speech disruption occurring on a verb is followed by a correct verb could also be revealing. If the disruption were followed by the accurate verb production, this would signal that the TD adolescents know how to correct it. The SLIs may not be using disruptions to help them correct verbs, or even know if they are incorrect in the first place. In contrast, the production of

inaccurate verbs may have been missed if there was not a disruption occurring around it. Another analysis could involve looking at the type of verb used to see if adolescents with SLI use more present tense verbs, since past tense verb morphology has shown to be more problematic for these individuals. A proportion of present tense verbs to past tense verbs could be made.

Appendix A

Narrative sample

1	(Right) one night there was a boy and his dog and that,
2	all looking at the (f) frog in the jar,
3	and the boy and the dog went to bed
4	and the frog jumped out of the jar.
5	And when they woke up in the morning the frog was gone.
6	And they got dressed
7	and the dog was sniffing around and looked in the jar
8	and he got his head stuck in the jar.
9	And they started climbing around, looking for the frog,
10	and he fell out the window
11	and the jar came off his head.
12	And . so they went into the forest to find another frog, calling out to a frog, (um) looking down (burrow) rabbit holes and things like that, and . came across some bees.
13	(and) Dog knocked the beehive out of the tree.
14	(Um, . ah) . and they got swooped by this owl because (um) annoying its nest,
15	and the boy climbed on a rock . (ah) calling out again at the frog.
16	And then this . deer . (um) got the boy off the rock and threw him over the ledge,
17	and then they fell into the lake,
18	and . they were hiding behind a log, . looking for the frog still,
19	and they seen these frogs,
20	(uh) pretty happy.
21	(And) they caught one
22	and took it home.
23	That's it.

Corresponding transcription

Utterance	Code
2	5a
12	15iii
12	9c
12	2Ab
12	15ic
13	11q
14	9q-15i-9q
14	15iq
14	9c
15	15ic
15	9c
16	15ia
16	15ic
16	9c
18	15ia
18	15ic
20	9q
21	11q

Appendix B

Types of Revisions		
Revision Type (1, 2, 3, or 4)	Description	Example
1. Correct forward revision	a correct element immediately preceding the target element of an utterance and the target element of the utterance is correct but different from the disruption	"The boy turned away." "The boy turns away."
2. Incorrect forward revision	an incorrect element immediately preceding the target element of an utterance and the target element is then corrected	"The boy were happy." "The boy was happy."
3. Incorrect forward incorrect revision	an incorrect element immediately preceding the target element of an utterance and the target element is also incorrect but different from the disruption	"The frog falled out the window." "The frog is fallen out the window."
4. Correct forward incorrect revision	a correct element (single word or phrase) immediately preceding an incorrect target element of an utterance	"The frog had a family." "The frog haved a family."

Appendix C

Speech Disruption Type			The reason for or element(s) causing the speech disruption	
Correct forward revision	1	Type of Revision Lexical = A Grammatical = B Both = C	Noun	a
Incorrect forward revision	2		Noun phrase	b
Incorrect forward incorrect revision	3		Verb	c
Correct forward incorrect revision	4		Verb phrase	d
Part word repetition	5		Adjective	e
Correct forward repetition	6		Adverb	f
Incorrect forward repetition	7		Preposition	g
Whole utterance repetition	8		Prepositional phrase	h
Single filled pause	9		Conjunction	k
Multiple filled pause	10		Gerund	m
Single word interjection	11		Participle (present)	n
Multiple word interjection	12		Participle (past)	o
Multiple filled and interjection combination	13		Infinitive	p
Phrase interjection or abandoned	14		Clause or utterance initiating	q
Silent pauses	15	Type Silent Pause Short internal = i Long internal = ii (code reason for disruption) <hr/> Short utterance initiating conj & clause = iii Long utterance initiating conj & clause = iv Long between consecutive utterances = v	Other (and describe)	r

Disruption Type	Subtype of Revision	Name	Description	Example
Revisions	Lexical word choice that is changed in the target word Grammatical grammatical choice that is changed in the target word or phrase Both word and grammatical choices are changed in the target word or phrase	Correct forward revision	a correct element immediately preceding the target element of an utterance and the target element of the utterance was correct but different from the disruption	"The boy turned away." "The boy turns away."
		Incorrect forward revision	an incorrect element immediately preceding the target element of an utterance and the target element is then corrected	"The boy were happy." "The boy was happy."
		Incorrect forward incorrect revision	an incorrect element immediately preceding the target element of an utterance and the target element is also incorrect but different from the disruption	"The frog falled out the window." "The frog is fallen out the window."
		Correct forward incorrect revision	a correct element (single word or phrase) immediately preceding an incorrect target element of an utterance	"The frog had a family." "The frog haved a family."
Repetitions		Part word repetition	initial or final phonemes of a word are repeated immediately preceding the target word	"I lo love to go outside."
		Correct forward repetition	a correct element (single word or phrase) immediately preceding the target element of an utterance and the target element occurs correctly in the utterance and additional words that follow	"He looked." "He looked at his dog."
		Incorrect forward repetition	an incorrect element (single word or phrase) immediately preceding the target element of an utterance and the target element is incorrect and identical to the disruption and additional words follow	"He runned." "He runned to the frog."
		Whole utterance repetition	a correct repetition of an entire target utterance	"Then he looked behind the log." "Then he looked behind the log."
Filled Pauses and Orphans		Single filled pause	a nonlexical interjection one-syllable vocalization	"Um"
		Multiple filled pause	same or different multiple syllable nonlexical vocalizations	"Um er" or "Um um"
		Single word interjection	a word that does not contribute information to an utterance	"Like"
		Multiple word interjection	same or different words that do not contribute information to an utterance	"Like for" or "Like like"
		Multiple filled and interjection combination	single or multiple filled pauses in combination with single or multiple word interjection	"Um like" or "Um um like for"
		Phrase interjection or abandoned	a phrase that does not contribute information to an utterance or an abandoned utterance	
Silent Pauses		Short internal pause	the period of time when no phonation is made during spoken discourse for less than five seconds within an utterance	"The dog . looked around."
		Long internal pause	the period of time when no phonation is made during spoken discourse for more than five seconds within an utterance	"The dog ... looked around."
		Short utterance initiating conjunction and clause	the period of time when no phonation is made during spoken discourse for less than five seconds at the beginning of an utterance immediately after a conjunction	"And . when he was sleeping during the night the frog left."
		Long utterance initiating conjunction and clause	the period of time when no phonation is made during spoken discourse for more than five seconds at the beginning of an utterance immediately after a conjunction	"And ... when he was sleeping during the night the frog left."
		Long between consecutive utterances	the period of time when no phonation is made during spoken discourse for more than five seconds at the end of an utterance while transitioning to another utterance	"The boy was looking over at a log in the water ..."

Instructions

Consider the following instructions while using this coding system to classify speech disruptions by their type and location within a language sample.

Introduction

The “Definitions of Speech Disruption Type” template provides definitions of the different speech disruptions, classified by the type of speech disruption. Each speech disruption will be classified as a revision, repetition, silent pause, or filled pause and orphan. The “Coding Guide” provides symbols to identify types of speech disruptions and the “reason for the disruption” (e.g. speech part) on the coding sheet with “Subject Number” on the top. Use the “Coding Guide” as a key for labeling types of disruptions and the reason for the disruption for each utterance that contains a disruption. Disruptions are located inside parentheses or noted by dots (e.g. periods). Determine the reason for the disruption by noting which part of speech that the disruption immediately precedes. Please reference the example transcript.

Subtypes of Disruptions for Revisions and Silent Pauses

A revision will need to be labeled as lexical, grammatical, or both lexical and grammatical for the type of change that was made. There are also five different types of silent pauses. A silent pause will need to be subclassified as one of these five types. Code the “reason for the disruption” after short internal and long internal silent pauses, but not for short and long utterance initiating conjunction and clause nor for long between consecutive utterances. When short internal and long internal silent pauses are within the same set of parentheses as another speech disruption, do not code the “reason for disruption” for short internal and long internal silent pauses.

Punctuation

There are several punctuation marks within the transcripts. All commas are insignificant to the coding system and should be ignored completely. Single periods at the ends of utterances are insignificant to the coding system and should be ignored. However, if there are three periods at the end of an utterance then this signifies that the subject created a silent pause that was longer than five seconds. Three periods at the end of an utterance should be coded as “long between consecutive utterances” as explained in the “Definition of Speech Disruption Type” template. Variations in transcription do not contribute to the coding system and should be considered “transcriber idiosyncrasies.” Any single periods or three periods within an utterance should be coded. Consult the “Definition of Speech Disruption Type” for how to code these silent pauses within an utterance.

Multiple Disruptions

If an utterance has more than one disruption that are within one set of parenthesis then these different disruptions should be coded on the same line of the coding sheet separated by a hyphen. If the multiple disruptions occur at different places in an utterance (i.e., in different sets of parentheses) then they should be coded as two different disruptions on separate lines of the coding sheet, each with the same utterance number.

Opening and Closing Interjections

If the first or last word that subjects say in their language sample is an interjection then this speech disruption should not be coded. Any transcript with an interjection as the opening or closing word should be ignored.

Noun Phrase, Verb Phrase, and Prepositional Phrases

There are three “reasons for the disruption” in the “Coding Guide” that could be coded as a part of speech or a part of speech phrase. Noun, verb, and preposition all have an option to be coded as a noun, noun phrase, verb, verb phrase, preposition, or prepositional phrase. In the case of a noun, code using the “noun” option when the disruption is preceding a noun. If the disruption is preceding an article or modifier within a noun phrase, code using the “noun phrase” option. The same applies for verb and verb phrase as well as preposition and prepositional phrase.

Appendix D

Speech Disruption Type			The reason for or element(s) causing the speech disruption	
Correct forward revision	1	Type of Revision Lexical = A Grammatical = B Both = C	Noun	a
Incorrect forward revision	2		Verb	b
Incorrect forward incorrect revision	3		Adjective	c
Correct forward incorrect revision	4		Adverb	d
Part word repetition	5		Preposition	e
Correct forward repetition	6		Conjunction	f
Whole utterance repetition	7		Gerund	g
Single filled pause	8		Present participle	h
Single word interjection	9		Infinitive	k
Multiple word interjection	10		Clause or utterance initiating	m
Multiple filled and interjection combination	11		Other (and describe)	n
Phrase interjection or abandoned	12			
Silent pauses	13	Type Silent Pause Short internal = i Long internal = ii (code reason for disruption)		
		Short utterance initiating conj & clause = iii Long between consecutive utterances = v		

Instructions

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Subtypes of Disruptions for Revisions and Silent Pauses

A revision will need to be labeled as lexical, grammatical, or both lexical and grammatical for the type of change that was made. There are also five different types of silent pauses. A silent pause will need to be subclassified as one of these five types. Code the “reason for the disruption” after short internal and long internal silent pauses, but not for short utterance initiating conjunction and clause nor for long between consecutive utterances. When short internal and long internal silent pauses are within the same set of parentheses as another speech disruption, do not code the “reason for disruption” for short internal and long internal silent pauses.

Punctuation

There are several punctuation marks within the transcripts. All commas are insignificant to the coding system and should be ignored completely. Single periods at the ends of utterances are insignificant to the coding system and should be ignored. However, if there are three periods at the end of an utterance then this signifies that the subject created a silent pause that was longer than five seconds. Three periods at the end of an utterance should be coded as “long between consecutive utterances” as explained in the “Definition of Speech Disruption Type” template. Variations in transcription do not contribute to the coding system and should be considered “transcriber idiosyncrasies.” Any single periods or three periods within an utterance should be coded. Consult the “Definition of Speech Disruption Type” for how to code these silent pauses within an utterance.

Multiple Disruptions

If an utterance has more than one disruption that are within one set of parenthesis then these different disruptions should be coded on the same line of the coding sheet separated by a hyphen. If the multiple disruptions occur at different places in an utterance (i.e., in different sets of parentheses) then they should be coded as two different disruptions on separate lines of the coding sheet, each with the same utterance number.

Opening and Closing Interjections

If the first or last word that subjects say in their language sample is an interjection then this speech disruption should not be coded. Any transcript with an interjection as the opening or closing word should be ignored.

Noun Phrase, Verb Phrase, and Prepositional Phrases

If a disruption is caused by a noun phrase, code the “noun” option. Code “verb” for a verb phrase and “preposition” for a prepositional phrase.

References

- Conti-Ramsden, G., & Durkin, K. (2008). Language and independence in adolescents with and without a history of specific language impairment (SLI). *Journal of Speech, Language, and Hearing Research, 51*(1), 70-83.
- Dollaghan, C.A. & Campbell, T. F. (1992). A procedure for classifying disruptions in spontaneous language samples. *Topics in Language Disorders, 12*(2), 56-68.
- Guo, L.-Y., Tomblin, J.B., & Samelson, V. (2008). Speech disruptions in the narratives of English-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 51*(3), 722-738.
- Hadley, P.A., & Short, H. (2006). Individual differences in the onset of tense marking: A growth-curve analysis. *Journal of Speech, Language, and Hearing Research, 49*(5), 984-1000.
- Leonard, Laurence B. (1998). *Children with specific language impairment*. Cambridge, MA: MIT Press.
- Loban, W. (1976). *Language development: Kindergarten through grade twelve*. Urbana, IL: National Council of Teachers of English.
- MacLachlan, B. G. & Chapman, R. S. (1988). Communication breakdowns in normal and language learning-disabled children's conversation and narration. *Journal of Speech and Hearing Disorders, 53*, 2-7.
- Mayer, M. (1969). *Frog, Where are you?* New York: Dial Books for Young Readers.

- Miller, C.A., Leonard, L.B., & Finneran, D. (2007). Grammaticality judgements in adolescents with and without language impairment. *International Journal of Language & Communication Disorders*, 43(3), 346-360.
- Reed, V.A., & Patchell, F.C. (2007). Informativeness of the spoken narratives of younger and older adolescents with specific language impairment and their counterparts with normal language. *Clinical Linguistics & Phonetics*, 21(11-12), 953-960.
- Rice, M. L. (2000). Grammatical symptoms of specific language impairment. In D. M. V. Bishop & L. Leonard (Eds.), *Speech and language impairment in children: Causes, characteristics, intervention and outcome* (pp. 17-34). East Sussex, UK: Psychology Press.
- Rice, M. L., Hoffman, L., & Wexler, K. (2009). Judgments of omitted BE and DO in questions as extended finiteness clinical markers of specific language impairment (SLI) to 15 years: A study of growth and asymptote. *Journal of Speech, Language, and Hearing Research*, 52(6), 1417-1433.
- Schwalbe, C. L. (2012). *Development of a coding system for identifying speech disruptions of adolescents with and without specific language impairment*. Thesis, James Madison University, Harrisonburg, VA.
- Taliaferro, M., Reed, V.A., & Patchell, F. (2015, November). *Verb morphology of young adolescents with SLI: Patterns from two narrative elicitation tasks*. Poster presented at the ASHA Convention, Denver, CO.

National Institutes of Health: National Institute on Deafness and Other Communication

Disorders (2011). Specific language impairment. Retrieved from

<http://www.nidcd.nih.gov/health/voice/pages/specific-language-impairment.aspx>